IMAGING SYSTEM USING MULTI-MODE LASER ILLUMINATION ENHANCE IMAGE QUALITY

Abstract

The quality of image produced by confocal microscopy, and especially scanning laser confocal microscopy, is enhanced especially for images obtained in turbid mediums such as many biological tissues specimens, by reducing speckle from scatterers that exist outside (above and below) the section which is being imaged by utilizing reduced coherence illumination, such as provided by a multi-mode laser. The laser beam is focused to provide its intensity in lobes forming offset spots in opposite (180°) amplitude phase relationship. The lobes are combined in the return light from the section and detected after passing through the confocal aperture of the confocal microscope. Images can be formed from the detected return light. Light from scatterers outside the section of interest, which are illuminated by both of the lobes beams overlap outside the section and interfere, thereby reducing speckle due to such scatterers, and particularly scatters which are adjacent to the section being imaged.